

What is claimed is:

1. A polymer composite formed from a three dimensional network structure comprising:

5 an organic polymer (A) comprising either a polymer produced from a water soluble (meth)acrylate ester (a), or a copolymer of a water soluble (meth)acrylate ester (a) and at least one compound selected from a group consisting of (meth)acrylamide and N-substituted (meth)acrylamides (b); and
a water swelling clay mineral (B).

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2. A polymer composite according to claim 1, wherein said organic polymer (A) is also subjected to cross linking with an organic cross linking agent (C).

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3. A polymer composite according to claim 1, wherein a glass transition temperature of said organic polymer (A) is no more than 100°C.

4. A polymer composite according to claim 1, wherein a weight ratio of said water swelling clay mineral (B) / said organic polymer (A) within said polymer composite is within a range from 0.003 to 3.

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5. A polymer composite according to claim 1, wherein said water soluble (meth)acrylate ester (a), and said (meth)acrylamide and N-substituted (meth)acrylamides (b) are soluble in either water or a mixed solvent of water and an organic solvent.

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6. A polymer composite according to claim 1, wherein said water soluble

(meth)acrylate ester (a) is at least one compound selected from a group consisting of methoxyethyl acrylate, ethoxyethyl acrylate, methoxyethyl methacrylate and ethoxyethyl methacrylate.

- 5 7. A polymer composite according to claim 1, wherein said organic polymer (A) is a copolymer of a water soluble (meth)acrylate ester (a) and at least one compound selected from a group consisting of (meth)acrylamide and N-substituted (meth)acrylamides (b), and a molar ratio of (b)/(a) within said copolymer is no more than 1.

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8. A polymer composite according to claim 1, wherein a tensile strength of said polymer composite is at least 500 kPa, a tensile breaking elongation is at least 200%, and an elastic modulus at a tensile elongation of 100% is at least 50 kPa.

- 15 9. A stretched product of a polymer composite produced by stretching a polymer composite according to any one of claim 1 through claim 8.

10. A stretched product of a polymer composite according to claim 9, wherein a tensile strength of said stretched product is at least 1000 kPa, a tensile breaking
20 elongation is at least 200%, and an elastic modulus at a tensile elongation of 100% is at least 100 kPa.

11. A production process for a polymer composite or a stretched product thereof, comprising the steps of:

- 25 dissolving or uniformly dispersing a water swelling clay mineral (B), a water

soluble (meth)acrylate ester (a), a polymerization initiator, and where necessary a catalyst and/or an organic cross linking agent (C) in either water or a mixed solvent of water and an organic solvent;

polymerizing said component (a);

5 conducting drying to remove said solvent; and

performing or not performing a subsequent stretching treatment.

12. A production process for a polymer composite or a stretched product thereof, comprising the steps of:

10 dissolving or uniformly dispersing a water swelling clay mineral (B), at least one compound selected from a group consisting of (meth)acrylamide and N-substituted (meth)acrylamides (b), a water soluble (meth)acrylate ester (a), a polymerization initiator, and where necessary a catalyst and/or an organic cross linking agent (C) in either water or a mixed solvent of water and an organic solvent;

15 copolymerizing said component (a) and said component (b);

conducting drying to remove said solvent; and

performing or not performing a subsequent stretching treatment.